Title: Argument
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Identification of the Case
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Contents of Argument
Reasons:

1. The Examiner cited the following publications to demonstrate that the inventions of the present application could be easily made based on the inventions disclosed by these publications by a person skilled in the art and concluded that they are unpatentable in accordance with Paragraph 2 of Article 29 of the Patent Law:

   Reference 1: Japanese Unexamined Patent Publication No.083899/1982
   Reference 2: Japanese Unexamined Patent Publication No. 022925/1992
   Reference 3: Japanese Unexamined Patent Publication No. 297027/1990

2. The applicant carefully examined the above publications and makes an amendment to the specification in the form of a written amendment which the applicant files along with this argument. This amendment clarifies the features of the inventions of the present application.
   If you accept this amendment, we think that clearly the amended inventions cannot be made easily based on the inventions disclosed in the above publications. We hope the Examiner will examine them and make a decision to acknowledge their patentability.

3. The invention claimed in the new Claim 1 is as follows:
   "A method of transmitting an optical supervisory signal in an optical transmission system which multiplexes an optical data signal and an optical supervisory signal containing optical transmission system monitoring information and transmits them

through an optical transmission line, the method comprising the steps of:

outputting exciting light which is used to amplify said optical supervisory signal;

multiplexing said outputted exciting light with said optical data signal through a first optical multiplexer;

sending said multiplexed exciting light and optical data signal to an optical fiber;

amplifying said optical data signal using said exciting light through said optical fiber;

outputting said optical supervisory signal;

multiplexing said amplified optical data signal with said outputted optical supervisory signal through a second optical multiplexer; and

transmitting said multiplexed optical data signal and said optical supervisory signal to said optical transmission line,

wherein the wavelength of said optical supervisory signal is out of the amplification range of said optical fiber and such a wavelength that transmission loss of said optical supervisory signal in said optical transmission line is virtually the same as transmission loss of said optical data signal in said optical transmission line."

This method allows monitoring of an optical transmission line and transmission of supervisory information without an output power drop during amplification of an optical data signal by an optical fiber.

4. The invention described in Reference 1 concerns a technique that a main signal is regenerated/repeated or simply passed and a supervisory signal is regenerated/repeated after its frequency is varied from station to station. The invention described in Reference 2 concerns a technique that exciting light is modulated and thus also used as supervisory light. Reference 3 describes a method of removing ghost light for improvement in the sensitivity of a receiver having an optical fiber.

5. On the other hand, as clearly indicated by the new claims of the amended application, an optical data signal multiplexed with exciting light is amplified by an optical fiber and then the amplified optical data signal is multiplexed with the optical supervisory signal and sent to an optical transmission line. Here, the

wavelength of the optical supervisory signal is out of the amplification range of the optical fiber and such a wavelength that transmission loss of the optical supervisory signal in the optical transmission line is virtually the same as transmission loss of the optical data signal in the optical transmission line.

6. According to the Examiner, the technique that an amplified optical data signal is multiplexed with an optical supervisory signal is described in Reference 1, and it is not particularly difficult to use an optical amplification technique for amplifying the optical data signal if the invention described in Reference 2 is adopted.

An object of the invention described in Reference 1 is to facilitate identification of the location of a fault between terminals. In this case, an optical supervisory signal whose wavelength varies with the repeater between terminals is superimposed on a main signal and each supervisory signal is wavelength-divided and converted into an electric signal at the receiving end to measure the level of each signal. In other words, the purpose of multiplexing (coupling) or demultiplexing (dividing) a main signal and an optical supervisory signal in each repeater is to superimpose a fault search current on an optical supervisory signal.
By contrast, the invention claimed in Claim 1 offers a solution to a problem which might result from "optical amplification" (which is not described in Reference 1). The problem refers to a phenomenon that when an optical data signal is optically amplified together with an optical supervisory signal, the gain of the optical data signal decreases, resulting in a drop in the optical data signal output power. In order to solve the problem, the present application proposes an approach that after an optical data signal is optically amplified, it is multiplexed with an optical supervisory signal.
In the invention described in Reference 2, exciting light with a wavelength of approximately 1.48 μm is also used as an optical supervisory signal, and both a main signal and the exciting light/supervisory light signal are optically amplified before being sent to an optical transmission line. It is because exciting light also serves as supervisory light that the wavelength of an optical supervisory signal is 1.48 μm in the invention described in Reference 2. This is conceptually different from the invention claimed in Claim 1 in which exciting light and supervisory light are separately outputted. In the invention described in Reference 2, both a main signal and an optical supervisory signal are optically amplified, which would pose a problem that the present invention is intended to solve.

On the other hand, in the invention claimed in Claim 1, an optical supervisory signal and exciting light are separate from each other; the optical data signal and exciting light enter an optical fiber amplifier where the optical data signal is amplified; and the amplified optical data signal is multiplexed with the optical supervisory signal. In addition, the wavelength of the optical supervisory signal is out of the amplification range of the optical fiber and such a wavelength that transmission loss of the optical supervisory signal in the optical transmission line is virtually the same as transmission loss of the optical data signal in the optical transmission line. This produces a particular effect of preventing a decline in the gain of the optical data signal due to the optical fiber.

7. As mentioned above, the invention claimed in Claim 1 has a constitution and effects which are not suggested by the cited references. Therefore, we consider that even a person skilled in the art cannot easily think of the invention claimed in Claim 1 based on the inventions described in References 1 and 2.

8. The invention claimed in the new Claim 3 is as follows:

"A method of receiving an optical supervisory signal in a optical transmission system which multiplexes an optical data signal and an optical supervisory signal containing optical transmission system monitoring information and transmits them through an optical transmission line, the method comprising the steps of:

receiving said optical data signal and said optical supervisory signal which have been multiplexed and transmitted through said optical transmission line;

demultiplexing said optical data signal and said optical supervisory signal;

receiving said demultiplexed optical supervisory signal;

outputting exciting light which is used to amplify said optical data signal;

multiplexing said demultiplexed optical data signal with said outputted exciting light;

sending said multiplexed exciting light and optical data signal to an optical fiber; and

amplifying said optical data signal using said exciting light through said optical fiber;

wherein the wavelength of said optical supervisory signal is out of the amplification range of said optical fiber and such a wavelength that transmission loss of said optical supervisory signal in said optical transmission line is virtually the same as transmission loss of said optical data signal in said optical fiber."

This method allows monitoring of an optical transmission line and reception of supervisory information without an output power drop during amplification of an optical data signal by an optical fiber.

9. According to the Examiner, the technique that a received optical signal is optically amplified in a system where wavelength division multiplexing of a supervisory signal is done is described in Reference 3, and it is easy for a person skilled in the art to apply the technique to the inventions described in References 1 and 2.
However, the differences of the present application from the inventions described in References 1 and 2 are as discussed above. We recognize that the technique that a received optical signal is optically amplified in a device as mentioned in Reference 3 is publicly known as described in connection with the "prior art" in the specification of the present application and also as pointed out by the Examiner.
By contrast, in the invention claimed in Claim 3, in order to prevent the gain of a received optical data signal from declining when it is optically amplified, the received optical data signal and optical supervisory signal are divided or demultiplexed and the demultiplexed optical data signal is optically amplified. This produces a particular effect of preventing a drop in the output power of the amplified optical data signal. In addition, according to Claim 3, the wavelength of the optical supervisory signal is out of the amplification range of the optical fiber and such a wavelength that transmission loss of the optical supervisory signal in the optical transmission line is virtually the same as transmission loss of the optical data signal. This provides a method of receiving an optical supervisory signal with a high wavelength utilization efficiency without causing a decline in the gain of the optical data signal due to the optical fiber and produces a particular effect of preventing the optical signal transmission distance from decreasing.

10. As mentioned above, the invention described in Claim 3 has a constitution and effects which are not suggested by the cited references. Therefore, we consider that even a person skilled in the art cannot easily think of the invention as claimed in Claim 3 based on the inventions described in References 1 to 3.

11. The inventions described in the new Claims 2 and 4 further limit those in Claims 1 and 3 respectively. Specifically, in the new Claims 1 and 4, the wavelength of an optical supervisory signal is in the range from 1.48 μm to 1.60 μm. This range

(1.48 μm to 1.60 μm) is out of the amplification range of the optical fiber and transmission loss of the optical supervisory signal in the optical transmission line is virtually the same as transmission loss of the optical data signal. Since a wavelength within this range is selected as the wavelength of the optical supervisory signal, the optical signal transmission distance does not decrease. Also this produces a particular effect of providing an optical repeater with a high wavelength utilization efficiency. We consider that this is not a matter that a person skilled in the art can select as appropriate.

12 As mentioned above, we think that clearly the inventions claimed in Claim2 to 4 have constitutions and effects which are not suggested by the cited references. Therefore, we consider that even a person skilled in the art cannot easily think of the invention as claimed in Claim 2 or 4 based on the inventions described in References 1 to 3.

13. As we have explained above, we believe that the inventions of the present application apparently have constitutions and effects which are not suggested by the cited references. We cordially ask you to examine them and make a decision to acknowledge their patentability.

[Necessity for proof] Needed